

SYMMETRY AND PROPORTION IN DRAWINGS:
AN ACCURATE AND REFINED METHOD

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Today biologists usually have a good camera, probably a 35 mm single lens reflex type. This method makes use of such a camera and a 35 mm slide projector. There is no need to obtain a special second camera and no need for the opaque projector. Depending on the size of the specimen, one of the following items is needed: a close-up lens, a set of extension tubes or bellows, or a camera-to-microscope adapter.

There are 2 alternatives. Black and white reversal film or color transparency film may be used. I recommend using color film for 2 reasons. The color transparency may be kept as an excellent record, and it is convenient for comparing color when one is doing color illustrations. Black and white reversal film is less expensive and faster and may become indispensable when working with the microscope at high magnifications, due to its higher speed. With black and white film it will be easier to compare tone values. The final decision on which film to use will depend on individual need, artistic ability, and budget.

For color I recommend using a low speed daylight film with negligible grain. Use direct sunlight for illuminating the subject. There is no need for special lights and color rendition is normally more accurate. Reflectors, such as white paper, crumpled aluminum foil, or a mirror may be placed on the other side of the subject. One can experiment with various reflectors until the desired effect is obtained. One may even keep out of direct sunlight (protecting camera and film) by working in the shade, while using a mirror at some distance to reflect light on the specimen. A faster color film may be used when working with the microscope.

Accurate symmetry in the drawing is usually desired in top views. One should try to arrange the specimen to look as symmetrical as possible. With Coleoptera, for example, head, pronotum, and elytra should fall symmetrically on a head to tail axis. It is only necessary to arrange legs, antennae, and palpi on 1 side of the body. In some cases horns and mandibles may be treated the same way.

The actual method for making the drawing follows: Take a sheet of tracing paper and draw a straight line down the middle. With adhesive tape or other means secure the paper to a sheet of white illustration board. Secure both to a flat vertical surface (such as a wall) at the appropriate height corresponding to the height of the projector. Project the transparency unto the paper. Adjust the distance between projector and paper until the correct size image is obtained. Focus. Make sure the axis of the projected image coincides with the axial line on the paper. Draw one side of the specimen. Check the actual specimen in case corrections are necessary. Remove paper from the board and fold on the middle line. Trace the drawing on the other side of the line. Once completed, turn the drawing paper over and secure it to the final illustration paper or board. Trace by pressing hard with pencil or ball-point on the lines seen through the tracing paper. Carbon paper or graphite transfer paper may be used instead to obtain a stronger line when transferring the drawing from the tracing paper to the final illustration surface. The drawing is now ready to be inked.

A variation of the method is to project the image directly onto the final illustration surface (do not forget the line down the middle) and drawing 1 side of the specimen. Then take tracing paper trace the drawing, turn over the tracing paper and secure it to the illustration surface making sure both sides fit together. Transfer the second half. Ink the final drawing.